Frankly Speaking

Getting Back to Fundamentals

TRAFFIC engineering sprang from the need for a more expeditious movement of people and goods and greater safety in the use of EXISTING STREETS.

Traffic engineers, with accomplishment in obtaining relief from traffic congestion and accidents, prided themselves on "what traffic engineering could do with a one hundred dollar bill" to get immediate street traffic relief.

Such traffic officials have no grandiose ideas about being "ivory-tower" planners. Furthermore, the public has recognized the value and practical mindedness of trying to get the most out of already built streets before proposing additional or new and startling traffic facilities for moving people and goods. And Mr. Traffic Engineer, Mr. John Q. Public has supported you well! Why? Because you have by your traffic engineering cut down the costs of his transportation in a most economical manner. You were profitable public servants and not starry-eyed advocates of a future Utopia.

Visionary "traffic engineers" look upon your tried and proved procedures as prosaic, piecemeal and mere palliatives.

But the Utopians forget that in these days the fox-hole approach with all its local spade work is a sound means of achieving results.

The "planned approachers" forget that today's practical traffic engineer considers his pieces as a part of a comprehensive traffic plan; and when he tackles the job one piece at a time, he knows it will *not* be said of *his* results that "The operation was successful, but the patient died".

The most successful traffic engineers of the future, from the point of view of the public's convenience, safety and general welfare, will be those who have striven the hardest to get the maximum of transportation of people and goods at a minimum of cost to the user and the general public. Let's get back to fundamentals.

Leslie Williams

Editor, TRAFFIC ENGINEERING

VOLUME XIV APRIL, 1944 NUMBER 7

Current and Post-War Automobile Speeds

by E. H. HOLMES

This article is taken from a paper presented by Mr. Holmes (Assoc.), at the Traffic Engineering Session of the Greater New York Safety Council Convention, New York City, March 29, 1944. This session was sponsored jointly by the Council and the Institute of Traffic Engineers; subject—Current and Post-war Speeds. Mr. Holmes is Acting Chief of the Division of Highway Transport Research, Public Roads Administration, Washington, D. C. The open discussion which followed presentation of this paper will be found in the succeeding pages.

One of the unexpected items that we can enter on the credit side of the ledger of war cost is the greatly increased consciousness of motor vehicle speeds. Official requests from Washington that speeds be held first to 40 and then to 35 miles per hour, met an immediate and almost unanimous response from public officials responsible for highway traffic throughout the country. Safety and conservation organizations pointed their educational guns toward the objective of reducing speeds, and the motor vehicle and allied industries through their advertising mediums directed public attention to the need for conserving motor vehicle transportation. And to measure the effectiveness of this concerted effort, studies of motor vehicle speeds are being conducted in unprecedented numbers.

At the request of the Highway Traffic Advisory Committee to the War Department and of the Public Roads Administration, speeds of vehicles at representative points on rural highways the country over are being regularly reported. In one recent period reports were received from 41 States, whereas adequate records prior to Pearl Harbor could be found in only 17 States. It is to be hoped that this awareness of the speed problem can be maintained in the postwar period, for it is only by constant review of the problem and critical analysis of the effect of whatever measures are taken, that its solution may be found.

Nationwide Trends

What, then, has been accomplished in reducing speeds to a level consistent with the need for motor vehicle conservation? Figure 1 shows the average

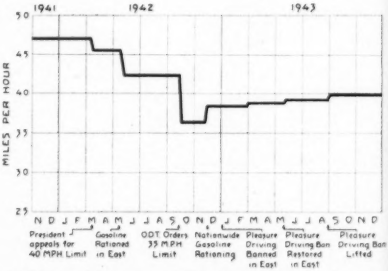


FIGURE 1.-AVERAGE WARTIME SPEEDS ON MAIN RURAL HIGHWAYS BY PERIODS

rural speeds throughout the country calculated from figures submitted by the various States to the Public Roads Administration..

Why are speeds increasing? No positive actions or pronouncements have encouraged the belief that conservation is no longer necessary; rather, official statements have generally painted a discouraging picture with respect to tires, gasoline, and the vehicle itself. Perhaps the improving fortunes of war are having their effect. Perhaps

the American public is tiring of wartime restrictions. Whatever the reason, we are relaxing in our conservation efforts at a time when relaxation cannot by any measure be justified.

Enforcement vs. Speed

The thought that usually first comes to mind is the influence of enforcement practices. This element is

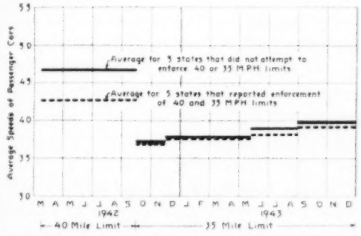

Average Speeds of Passenger Cars
55
50
45
40
35
30
Average for 5 states that did not attempt to enforce 40 or 35 M.P.H. limits
Average for 5 states that reported enforcement of 40 and 35 M.P.H. limits
M A M J J A S O N D J F M A M J J A S O N D
1942
1943
40 Mile Limit
35 Mile Limit

FIGURE 3 - COMPARISON OF AVERAGE PASSENGER CAR SPEEDS IN STATES THAT DID AND DID NOT ATTEMPT ENFORCEMENT OF PREVAILING NATIONWIDE SPEED LIMITS

difficult to evaluate statistically, at least from the information available to us in Washington. Strenuous enforcement efforts in an area where police forces are greatly undermanned may be relatively ineffective; on the other hand, the mere presence of patrolmen, even though limits are not strictly enforced, is bound to have a sobering effect on the driver. Recognizing these statistical limitations it is interesting, nevertheless, to compare in figure 3 the trend of speeds in five States in which it was reported that efforts were made to enforce the prevailing Nation-wide limits with the trends in five States in which the limits were reported to be non-enforceable because of the lack of appropriate legislative action or emergency powers. This figure shows a marked difference in observance of the 40-mile limit during the early stages of the war. It shows, however, an insignificant difference once speeds reached their lowest levels in the fall of 1942, since the 35-mile limit has been in effect. The conclusion, therefore, seems to be that enforcement activities have had less effect than voluntary conservation, engendered perhaps by the existence of enforceable limits in some cases, but probably more by the continuing publicity regarding vehicle, tire, and gasoline shortages.

Effect of Speed Limits

Another comparison that may be made, and one which opens a wider range of speculation, is the comparison of war speeds with prewar speeds in groups of States having different prewar speed limits, as shown in figure 4. Here on the left of the chart the top line shows the prewar speeds in 8 States in which there were no fixed limits. The average was just under 49 miles per hour. Then in order come lines showing the average prewar speeds in States having prewar limits of 60, 55, 50, and 40 miles per hour, respectively, the last line unfortunately representing only one State.

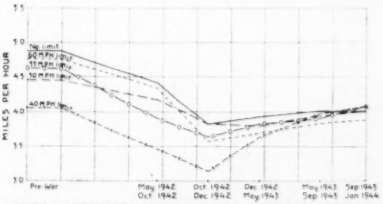


FIGURE 4 - AVERAGE SPEEDS OF VEHICLES BY PERIODS, CLASSIFIED BY STATES HAVING VARIOUS PRE-WAR SPEED LIMITS

It is significant that the average speeds varied directly with the speed limits and showed a wide range of more than 8 miles per hour between the highest and lowest average. Which is cause and which is effect is debatable. It seems likely, however, that a natural relation will always exist between desired and legal speeds, if only

because a regulation inconsistent with the pronounced desires of the majority is difficult if not impossible to enforce.

Now tracing each of these lines into the war period shows how these originally divergent habits have been molded into a uniform pattern. Since the beginning of 1943 the range of speeds in the States that originally had widely differing speeds and speed limits now is almost negligible. Furthermore, within this narrow range the prewar order has become completely jumbled, with the lowest prewar group now being bracketed with the original middle group in top position, and the lowest present position being occupied by States that originally showed the second highest average. The explanation of this feature is probably that the differences are so small that the order has become insignificant, but as mentioned before, this figure offers interesting possibilities for speculation.

Postwar Speed

This curve seems to have particular value, however, as a basis for forecasting what may occur when the war is ended. Speeds are already rising slowly but perceptibly. There is every reason to believe that once wartime restrictions are lifted, speeds will rapidly return to their prewar levels. Unless there are powerful campaigns of education and enforcement, backed by effective legislation, prewar speeds will again prevail. And accompanying this increase will be a wave of accidents and fatalities as vehicles and drivers, figuratively rusty through disuse, and with every variety of prewar, recapped, and synthetic tires, find the strain too great. Furthermore, it is reasonable to believe that we can look to the States having the highest speed limits or no fixed limits at all to take the lead in the postwar accident toll.

Our studies indicate that the reduction in speeds was not the result of a general slowing down of all vehicles. It came about by the sharp reduction in speed of the fastest group. We may expect, therefore, that as the averages rise after the war, the reason will be found in the reappearance of the high-speed driver in the traffic stream. It will pay us, therefore, to examine his characteristics particularly closely.

Factors Affecting Speed

Speed distributions as shown by figures that have been assembled at the many points on rural highways presumably might have been influenced by one or more of four principal factors: The road; the traffic; the vehicle; and finally the driver himself. Considering these factors in order, the road may limit speed because of its alinement or because of its surface condition. Neither of these conditions can have influenced the speeds on the sections included in the studies, however, for observation stations were invariably selected on level straightaway sections with smooth surfaces, with the specific objective of eliminating the highway itself as a factor influencing the driver's choice of speed. We may, therefore, count out the highway.

Traffic volume, the second item, has a significant influence on speed, even on level straightaways, but again this factor may be eliminated as a variable by considering only those vehicles so separated from vehicles traveling in the same or opposite direction that their speeds were unaffected by other traffic. A typical pattern of speed of such vehicles with the influence of the road and traffic eliminated shows that only 6 percent traveled faster than 60 miles per hour, and but 36 percent exceeded 50 miles per hour. Under these conditions, with the large majority of vehicles confined to the low- and moderate-speed ranges, we must look for explanation to the vehicle or its driver.

High Speed Records

It is not so easy to eliminate unknowns in these categories. But considering now the vehicle, let us look back a little into the history of speed. We see in figure 8 the average speeds

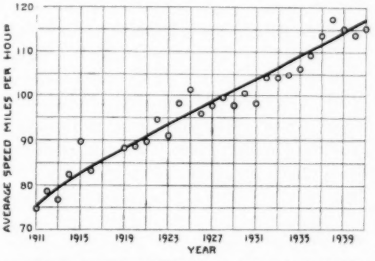


FIGURE 8.- AVERAGE SPEED OF WINNER IN MEMORIAL DAY RACES ON INDIANAPOLIS SPEEDWAY BY YEARS

Source - American Automobile Association

of the winning cars in the 500-mile Memorial Day races at Indianapolis. These figures are more closely related to our problem because they show steadily increasing speeds despite constantly tightening restrictions on such important elements as piston displacement and oil consumption. It shows that the application of the results of technical progress and of the country's inventive genius will produce faster and faster cars despite increasing stringency in operating economy. Incidentally, the vehicles setting these records bore a considerable resemblance to automobiles, and were steered, not sighted.

Now coming to the core of our problems of the vehicle, we see in figure 9 the trend in speed records set by American stock cars. These vehicles not only resemble, but actually are, the vehicles we see in our everyday traffic. They, too, have shown an increase in top speeds. From 1925, when only the high-priced cars could beat 60, we find that the average 1940 car in the low-priced field can exceed 80 miles per hour, and in the high-priced field it can top 90.

Two items are outstanding in this figure. First, the spread between speed capabilities of high- and low-priced cars has narrowed from 18 miles per hour in 1925 to less than 10 in 1940. In 1938 models it was only 8 miles per hour. Second, and more significant, is the general shape of the curve, which shows a definite leveling after 1934. Contrast this with the two previous diagrams. The rise in the mile record since 1925 has been almost meteoric. The rise in the Indianapolis speeds has been steady despite the increasing limitations imposed by the Contest Board. But stock car speeds have leveled off.

Clearly the manufacturer could have built in more speed if the speed capacity was not already equal to or in excess of the public's desires. Keeping this figure in mind, let us consider again the speed distribution of figure 6, which showed that the greatest number of drivers moving without interference of road or traffic wish to travel between 45 and 50 miles per hour, and that only a scattered few wish to drive at speeds above 60, a speed at least 20 miles per hour below the speed capacities of their vehicles.

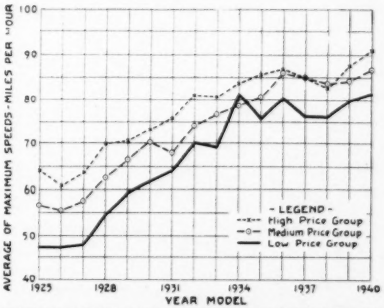


FIGURE 9.- AVERAGE TOP SPEEDS OF AMERICAN STOCK CARS IN HIGH, MEDIUM AND LOW PRICE RANGES BY YEAR MODELS

Source - Proving Ground Records

It is logical to conclude therefore that the vehicle also may be eliminated as a factor influencing the speed data

we are considering. Of the four original factors only the driver himself remains as a variable, and that variable is by far the most obscure and unpredictable in its behavior.

The Driver

Several years ago the Public Roads Administration undertook an investigation of the characteristics of individual drivers, working in collaboration with the Institute of Human Relations at Yale University, and the American Association of Motor Vehicle Administrators.

These studies revealed, among other factors, that out-of-State drivers traveled faster and drove newer cars than drivers residing in the State of the study; young persons drove somewhat faster than older persons; men drove slightly faster than women; drivers on long trips traveled faster than those on short trips; non-owners drove faster than those who owned their vehicles; drivers by themselves traveled faster than those accompanied by their relatives; and newer vehicles were driven faster than older vehicles.

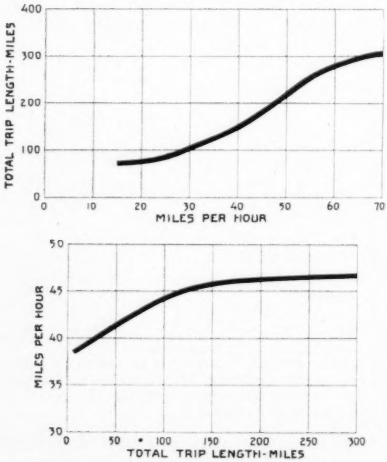


FIGURE 11.- RELATION BETWEEN SPEED AND TRIP LENGTH

Trip Length vs. Speed

Figure 11 shows the relation between trip length and speed, as determined from observations of some 13,000 drivers in the States of Connecticut, South Carolina, and California. The upper graph shows the average trip length of vehicles observed to be traveling at various speeds. It shows that drivers moving at 70 miles per hour were on trips that day that averaged over 300 miles in length. Those traveling at 60 miles per hour were on trips that averaged 280 miles in length, and so on. Those traveling less than 30 miles per hour were on trips that averaged less than 100 miles in length.

Here then is one element of the speed picture that should be helpful, for it shows that it is on the roads on which the longest trips can be expected that we will find the highest speeds.

Our studies showed us that while only 15 percent of all trips are longer than 20 miles, such trips account for 60 percent of all vehicle miles of rural travel. Similarly, trips of 100 miles or more in length amount to only 2 percent of all trips, but they account for approximately a quarter of our rural vehicle mileage, and correspondingly a quarter of our problem. The long-trip driver is doubly important. He not only stands as our fastest driver, but in our problem of speed control, he looms far out of proportion to his number.

Age of Automobile

The other particularly predominant item in the high-speed group was the age of vehicle. The average age of the vehicles traveling between 60 and 70 miles per hour was 1.6 years, and the average age of those traveling between 20 and 30 miles per hour was just over 6 years. Looking at the picture from the other direction, cars less

than 2 years old were driven, on the average, 47.5 miles per hour, and as the age increases the average driving speed steadily decreases.

It is not unexpected to find these results. We know that the long-trip drivers are the fast drivers. Because of their long trips they accumulate mileage more rapidly and trade cars more often than the average driver.

What does this relationship mean to our postwar problem? In normal times the long-trip, fast driver kept himself in new cars. After the war there will be no new cars. Does that mean, then, that the speeds will not increase to the levels of before the war, but rather will reach only the level formerly representative of cars 3 or 4 years old?

I doubt that that will be the case. It is more likely that we shall have the same, or perhaps even a greater representation of long-trip drivers in the postwar traffic than before the war. They will have the same or greater desires for speed than they exhibited before the war, but they will be attempting to satisfy those desires in vehicles and on tires that will not stand the pace. It seems to me that this is another extremely important factor in our postwar problem, and one to which our most effective educational efforts should be directed.

Future Speeds

If the vehicle and the roadway have caught or passed the driver in speed capacity, we must look to the drivers themselves with their human strengths and weaknesses as the index of our future speeds. In normal times we buy new cars every two or three years. We buy new highways every 20 or 30 years. But our physical and mental equipment is born with us and it must last a lifetime, even depreciating somewhat as life wears on, and psychological changes come about slowly if at all.

If as a Nation our living standard improves, as indeed it must, if, on the average, we drive newer cars, if our highways are designed in accordance with the functions they should serve, if travel is encouraged, if roadside hazards are reduced by limited or controlled access, then we must certainly anticipate higher average speeds. But these higher speeds will be attained not so much by a general increase throughout the range of present speeds as by a reduction in the proportion of low-speed driving.

DISCUSSION

Editor's Note: The following is a resume of the informal discussion following Mr. Holmes' paper. The members of the panel of experts who participated in this discussion, with occasional help from the audience, were as follows: **WILBUR SMITH**, Chairman, Associate Director, Yale Bureau for Street Traffic Research; **VIRDEN RITTGERS**, Rockland Coaches, Inc., Spring Valley, New York; **T. T. WILEY**, Associate City Traffic Engineer, Detroit; **JAMES HAYDEN**, Associated Transport, Inc.; **EDWIN KOESTER**, Wilmington City Traffic Engineer; **T. C. SMITH**, Automotive Engineer, American Telephone and Telegraph Company; **ROBERT RALEIGH**, Acting Director, International Association of Chiefs of Police; and **SPENCER MILLER, JR.**, New Jersey State Highway Commissioner.

CHAIRMAN: Mr. Holmes has given us a good overall view of the effects of traffic trends on speeds. Mr. Smith, will you give us your ideas on the relationship of vehicle design and speeds.

T. C. SMITH: Let me say that futuristic automobiles, such as we have been seeing in popular magazines lately, don't engineer very well. Right after the war we are going to see mostly 1942 models coming off the production lines, and as long as there is a seller's market, there won't be much change in automobile design. From the speed standpoint, the immediate postwar car shouldn't be much different than what we had immediately before the war. Fleet operators

are going to need lots of replacements after the war, and they will get 1942 models also.

Mr. Holmes made an important point, that accidents are liable to mount rapidly after the war unless drivers realize that their old automobiles won't go as fast as they did before the war, with safety. There will be a mixture of these prewar vehicles with the few new cars to be manufactured probably capable of 80 miles an hour, which will cause differentials in speed, always hazardous, which also will tempt owners of the old prewar cars to get up to the speeds of the new cars.

Let me make another point—there are bound to be more changes in automobiles than in trucks, since automobile design depends a lot on public whims, where trucks work on an economic basis. As taxes on fuel go up and other forms of taxation reduce the car owner's income, there will be a tendency to favor lighter, more economical automobiles, and these will cause greater hazards at high speeds because of wind resistance. You know wind resistance varies as a square of the velocity, so this may become a real factor if vehicles become much lighter in weight. This is an important factor above 50 m.p.h.

FLOOR: O.D.T. requests motorists to travel under 35 miles an hour, but in our state we can't enforce speeds under 35. Mr. Holmes, what do you think about that situation?

HOLMES: The O.D.T. 35 mile per hour request cannot be enforced in a state unless there's local enactment of a 35 mile per hour speed limit law. This blanket limit was originally requested in order to cut down on tire wear. I know that a lot of difficulty is being encountered because of the great trouble in trying to enforce this limit on trucks.

HAYDEN: You are absolutely right. We have found that trucks cannot operate as economically at 35 as at 45. According to some tests we (Associated Transport, Inc.) made, about a year ago using comparable loads, routes and equipment, we found that our trucks braked 117% more and there was 48% more shifting, most of the travelling being in low gear, comparing 35 miles an hour to 45 miles an hour operation. Trucks are designed to run at 45 and to keep them at a lower speed results in more wear on bearings, pistons, and so forth. The O.D.T. ran similar tests, operating our equipment and others, supporting our conclusions. We are certainly not in favor of speed above 45 but do feel that speeds below 45 are uneconomical for trucks.

FLOOR: How much difference is there between 35 and 45 for trucks in the amount of mileage lost?

HAYDEN: About one day per week.

FLOOR: What I meant was the tire mileage, the rubber lost at the higher speed?

HAYDEN: Well I can't say on that score, but I know that at the lower speed the trucks lose about one day a week of operation. Gasoline consumption is about 5% more at 35 than at 45 miles per hour.

CHAIRMAN: We have gotten some pretty good ideas here so far. Now, let's turn to Bob Raleigh of the International Association of Chiefs of Police, and ask him about this problem of enforcing the 35 mile per hour speed limit.

RALEIGH: The police can't enforce it unless local laws are enacted. This is one big reason that speeds are gradually creeping upward as Mr. Holmes pointed out in his fine paper, because it is so difficult to enforce the 35 limit in many states where there is no local law on the books.

FLOOR: Enforcement in our state has been hampered because of the lack of adequate signing of the new limit. We have had a lot of pressure to increase the limit to 40 miles per hour.

RALEIGH: There have been unofficial proposals before the IACP in favor of a 45 mile per hour limit for trucks and a 35 mile per hour limit for passenger cars. Nothing has been done about this though, and I don't think this would be feasible.

T. C. SMITH: I think there is more need to control truck speeds than those of passenger cars.

RALEIGH: Truckers are really up against a problem, because they are constantly under pressure from the military and others on one hand to get goods through in a minimum of time, while the police and O.D.T. on the other hand are demanding lower speeds for conservation.

CHAIRMAN: Mr. Rittgers, what is your thought with respect to the buses in this question of speed limits?

RITTGERS: I think that after the war, people will demand improvements in bus design to keep pace with passenger car design. If buses are going to keep their patronage, they can't afford to be referred to as "old crates" like so many are today. As for speed limits, there are only a few roads where buses are not limited by other traffic as to speed, and even there, as well as every place else, buses operate on schedules which determine to a great extent the maximum speed. Only long haul operators on inter-city trips will be greatly concerned with future speed limits. For them, the improved express highways will be of benefit. Local operators cannot use express highways so they won't be so concerned over high speeds. We have to remember that for a long time most of our people are going to live near and travel over existing roads, and there will be only a small proportion of the people travelling on the express highways via buses.

FLOOR: I don't see how you can expect private automobile operators to keep below 35 when buses, trucks, and military vehicles are all going over this limit. Proper design of the automobile will cure our speed problem. The automobile as it's designed now, operates smoothly at 45 to 50 miles per hour, while a driver has a definite strain on him to keep it at 35. Also it's strenuous to travel above 50. If the manufacturers would lower the comfortable operating speed to 35, we might have better luck in enforcing the speed in this range.

HAYDEN: We are 100% in favor of safety in truck operation. We (Associated Transport Inc.) found that the higher prewar speeds weren't as hazardous as our present lower speeds. The quality and state of repair of the equipment and the type of drivers are exceedingly important in the safety of operation, and I think sometimes they outweigh the element of speed.

T. C. SMITH: The accidents, of course, are often caused by inattention rather than because of any defect in the mechanism of the vehicle.

FLOOR: Mr. Hayden, do you have any statistics supporting your contentions that accident totals are greater today in truck fleets than they were in prewar days with higher speeds?

HAYDEN: Well, before the war we were running 50 miles per hour and over, and had a better accident record than today—but a fair comparison isn't possible because of poorer drivers today. In 48% of accidents we figured the driver was at fault. Today about 70% of the cases turn out to be the fault of the driver. The I.C.C. reports about 75%. Today our drivers run about 99,000 miles per accident.

WILEY: One of the biggest causes for accidents may be found in the dif-

ferentials of speed. If everyone were travelling the same speed, chances for accidents would be much less than where there is continual overtaking and passing and a mixture of sizes, weights, and speeds of vehicles.

CHAIRMAN: Now that we have explored the driver characteristics somewhat, let's turn to the relationship of roadway facilities and speeds. Commissioner Miller, will you give us some of your thoughts on future highway design as related to speed?

MILLER: It is not difficult to build safety into our highways. Also the automobile is capable of safe design, and cannot be found at fault for the majority of accidents. But the driver cannot be designed or equipped with built-in safety. Studies in industry have shown the relationship of fatigue to accident frequency, which indicates a high degree of correlation, and this undoubtedly holds for motor vehicle accidents also. For instance, the Pennsylvania Turnpike, although built for unlimited speeds on the straightaways, experienced some traffic accidents, so that finally certain limits had to be imposed. It was found that on the long tangents, drivers became fatigued and ran off the edge of the road for no other reason than fatigue. It would almost seem that a continuous series of curves would be safer from a standpoint of keeping the driver alert. I only bring this out to point out that although the road may be safe for unlimited speed, and the automobile capable of doing 80 or 100 miles per hour, drivers can't use the facilities without succumbing to fatigue or error in judgement or some other human frailty.

It costs a great deal of money to build safety into highways. It costs New Jersey about one million dollars per mile to build safe highways. Although we do have an extensive postwar program, now at the design stage, to build safe highways, it is still recognized that one of the biggest problems is with the operators of the motor vehicles. Education has not been given enough play in combating motor vehicle accidents, and should not be supplanted by enforcement. Emphasis should be laid on educating people to the commen courtesies of the road.

Another factor in future speed and traffic safety conditions is that we as a nation are growing old. In the age bracket of 60 to 65 years, there will be four times as many people ten years from today as there were ten years ago. This means greater chance for driver fatigue and confusion.

HOLMES: Let me make a point here—some comment has been made regarding the inter-regional highway system proposed for the post-war era, which represents about 1% of the total U. S. roadway mileage. This percentage may seem insignificant, but it will carry 20% of the Nation's traffic load, and we certainly need to raise our sights in the design standards of this 1%. The average car owner pays a considerable amount of money each year to own and operate his car, but only about 10% of his total outlay goes into highway construction and upkeep. He expects to have his highways kept in order, but some change should be made so that a larger percentage of his outlay for transportation goes into the highway, at least double the present proportion of 10%.

FLOOR: Maybe a bigger per cent would go to highways if it were not for diversion of funds to other uses.

CHAIRMAN: We have some city traffic engineers on our panel today, and I'm sure they can tell us something about their postwar plans for tackling the speed problem.

KOESTER: Speed regulation at the manufacturing level seems to be im-

practicable. Speed regulation should be by operational control. Wilmington plans to tackle the basis for excessive speed. These are, haste, impatience, and recklessness. Unreasonable traffic regulations and poor highway design increase impatience. Reckless drivers should be dealt with by the Police. We plan use of progressive timing of signals to reduce this factor of impatience, and also the use of short signal cycles.

WILEY: In the denser metropolitan areas, it is the element of time and not top speeds that is important to the driver. In Detroit the need is for capacity of roadways to handle the demands with smooth flow without too much stop and go, accident hazards, and delays.

CHAIRMAN: We have with us today a man who has done considerable research work in the field of driver psychology, Dr. Forbes, formerly associated with the Yale Bureau for Street Traffic Research, and now at Harvard University. Dr. Forbes will you express an opinion regarding the human factor?

FORBES: Driver capabilities will not be increased much in the future. This factor of driver limitations is a big one, and should be given more cognizance by highway design engineers. Such human engineering data will be of help in designing automobiles and roadways for the effect of age, reaction time, seeing ability, and so forth.

HAYDEN: Even though the driver limitations or capabilities cannot be increased much, can't we raise the present level of driver abilities by getting them to utilize their facilities more efficiently?

FORBES: Yes. Most of us don't operate up to our limits, and for this reason driver training can be very effective. But remember that there are certain limitations past which we shouldn't try to design roads or cars for operation.

FLOOR: One of the big loopholes is the lack of proper driver's license examinations in most states. We hear a lot about preventive maintenance of vehicles, in eliminating the things that are about to cause wear or cause accidents and delays, but why not talk also about preventive maintenance of drivers! Let's lubricate the driver's mind. Let get drivers' license examinations that are periodic and adequate, and include physical examinations at periodic intervals.

T. C. SMITH: We inspect automobiles once or twice a year in many states. Why not inspect the driver occasionally?

CHAIRMAN: I believe that Washington has a law requiring re-examination of the driver at the end of every license expiration.

MILLER: California does too.

CHAIRMAN: Accidents seem to be on the upgrade again. We expect a wave of traffic accidents in the immediate postwar era. There has been considerable discussion pro and con, and perhaps someone here has some ideas about whether or not we will have a great increase in accident rate.

RALEIGH: Let me cite an experience I recently had. Before the war I used to drive between 50 and 55 miles per hour, but lately I have been keeping it down below 40. The other day I took a ride in a police car where it was necessary for the driver to travel about 60 miles per hour, and I was literally scared to death, although I was confident of the driver's ability and so forth. But I have become acclimated to the habit of low speed. I wonder if lots of drivers won't feel the same way, and tend to keep the speeds down after the war, at least for a while.

HAYDEN: Motor vehicle inspections

should come back rapidly after the war; they do a lot of good.

RALEIGH: True, and police should devote more time toward enforcing against mechanical defects of vehicles.

KOESTER: I think that speeds will jump up rapidly when war restrictions are eliminated. The boys will come home from the fighting fronts used to excitement, and there will be a general feeling of wanting to let loose.

FLOOR: There is a big question that will have a lot of effect on postwar speed, and that is, the design of the postwar car. Since the manufacturers try to meet the public's wishes, I often wonder just what the public will demand insofar as automobile speed is concerned.

MILLER: It is an act of sheer irresponsibility for an automobile manufacturer to produce an automobile that will travel 120 miles an hour. The same manufacturer will turn right around and give money to highway safety. When an automobile is built capable of high speed, somebody is sure to try it out and drive it at the top speed. The manufacturer should give the public a flexible automobile, one that can accelerate fast, stop quick, but not one that offers a temptation to travel at excessive speeds, say up around 100 miles an hour.

T. C. SMITH: I think the manufacturer must design at least a 60 mile per hour automobile at the very minimum in order to give acceleration capabilities for safe operation. Commissioner Miller, as a taxpayer of New Jersey, may I ask you a question. Couldn't there be more speed zoning signs on New Jersey highways? I mean signs giving true maximum safe speeds in which the drivers would have confidence and would be glad to follow.

MILLER: In New Jersey we have approximately 1600 miles of well posted State highways, but there are not so many speed signs on the rural roads. It seems that a lot of our accidents from excessive speed occur at our traffic circles where trucks and buses crack up.

FLOOR: Commissioner Miller, what are the spacings of the speed signs on your straightaways in New Jersey?

MILLER: This depends upon the traffic density, and I don't recall the exact standards that are set up. But I believe that the longest spacing between signs is somewhere between 3,000 and 5,000 yards.

CHAIRMAN: We have with us Mr. Donald Berry, of the National Safety Council, who is secretary of the newly formed Joint Committee studying relationship of speed to accidents. Mr. Berry, will you say a few words.

BERRY: There is going to be a need for an educational program in the postwar period, to bring home to all drivers and pedestrians the limitations and hazards inherent in the transition period. The majority of automobiles will be old cars, not capable of giving the performance that they did before the war, and drivers will be out of practice. The toll of traffic deaths is beginning to rise already, and we must see that it does not go back up to high levels again. Unless drastic steps are taken, particularly along educational lines, we may have more vehicle fatalities in the year after the war is over than we did in the peak death year, 1941.

Relation of Traffic Composition to Roadway Capacity

by JOHN T. GIBALA

IN reviewing traffic flows on some of New York City's surface streets and bridges, it was found that traffic volumes on many of them approached the rate of 1,500 vehicles per lane per hour. Average flows at the rate of 1,000 or more vehicles per lane per hour were maintained for three hours or longer. On other streets the flow was much less. On streets which carried traffic at rates between 1,000-1,500 vehicles per lane per hour, the traffic moved along freely with some congestion, but apparent ease.

On the other hand, some streets carrying one-third less traffic at rates between 700-1,000 vehicles per lane per hour, were found to be heavily congested with average speeds reduced greatly. Some streets carry traffic averaging 1,200 vehicles per lane per hour with little congestion, while others carrying 800 are heavily congested along the entire street. This seeming paradox would lead one to conclude that theoretical concepts in terms of vehicular volumes have no bearing upon carrying capacity of highway lanes. Canal Street, for example, carries one third less traffic than Park Avenue under similar traffic signal control conditions, at speeds half as great.

Fluid Flow Analogy

How much traffic can a road carry? We may ask a similar question about how much fluid can a pipe carry? When we speak of fluid we immediately visualize all we learned about physics and hydraulics including the factors which control flow; *i. e.* friction, specific gravity, pressure and viscosity. With respect to fluid, the question arises: what kind?—water, alcohol, mercury or cold molasses?—what specific gravity and viscosity?—also what kind of pipe.

In a fluid, we rely upon many of the factors controlling flow of water, except in the highly specialized fields of hydraulics. We base many of our constants on water, specific gravity being one of them.

Factors Affecting Mobility

Highways are the conduits of transportation, vehicles the fluid in motion. The amount or volume of traffic which a highway can carry depends upon several factors; namely, kind and width of roadway, type and speed of the traffic. The highway may be modern, with divided roadways having limited access with no grade crossings, or it may be one of those types built many years ago. It may be a one-way roadway or one carrying traffic in both directions with opposing streams separated by a white line. The roadway may be narrow with eight-foot traffic lanes, or it may be wide having two or three lanes of ample width for each direction of traffic. The traffic may be all private passenger vehicles, or it may include trucks and buses. The mixture may be such that the trucks or buses or both may contribute toward a large portion of the whole,

or their number may be comparatively small. These are primary factors affecting mobility, like specific gravity or viscosity in a fluid. The speed at which vehicles travel is also a significant factor; it determines the spacing between vehicles to allow for safe stopping distances.

Traffic Lanes

The number, width and position of traffic lanes is important. The number of lanes gives a certain amount of latitude to drivers and in that way their preference for position, whether logical or fanciful, may throw them out of balance. On this number will depend the density of flow per lane. Their width will decide side clearances between vehicles and affect over-taking of slower vehicles by faster ones, especially with mixed traffic on roadway. Lanes of ample width will encourage over-taking while those of insufficient width will discourage overtaking to certain groups of drivers, who may be timid or reluctant to squeeze through lanes that are narrow. With heavy trucks or buses on adjacent lanes, especially on two-way roadways, drivers are prone to exercise a certain degree of reluctance in over-taking, thus slowing down the traffic stream behind them to speeds of the slower vehicles. Trucks and buses built to maximum allowable widths, 90 to 96 inches, leave little clearance between vehicles, especially on 8 and 10 foot lanes which were considered adequate a few years ago; and which will be with us many years yet.

The position of the lane, particularly on a multi-lane highway does have a certain influence upon its use, especially where the highway is not used at maximum capacity. The old established law of supply and demand applies to the use of highway space in this case. During the prevalence of this condition, the driver's choice is left unchallenged; he selects the lane he considers most convenient or safest to suit his purpose. However, during periods when the traffic reservoir or generator supplies traffic to saturate the highway, an entirely new condition presents itself. Now, the formerly less desirable or marginal lanes are in demand, they become filled, also to capacity, and the number of vehicles per lane under such conditions begins to equalize in a manner whereby the deviation in lane use between lanes is at a minimum. These conditions, of maximum density, present themselves daily upon certain roadways in most cities.

We find that traffic flows in terms of vehicles as generally defined in our Traffic Regulations, do not always present a true picture of the traffic situation, especially on highways carrying mixed traffic, trucks and buses.

Traffic Congestion

Traffic congestion which in most instances is the direct cause of reduced highway speeds is in itself a relative concept.

Congestion may be present when the average speed of vehicles through an area is reduced below that which traffic regulation and custom generally permit. Although causes may vary, we will consider for the purpose of this discussion that an excess of vehicles is the primary cause.

Studies and observations have indicated and a concensus of opinion has been reached that, when a highway begins to carry traffic at rates approximating two-thirds of its theoretical capacity, the critical capacity is reached and the results of congestion are evident. Under these conditions drivers begin planning to use other routes.

Comparison of Capacity Counts

Counts made at various points of traffic flowing at approximately capacity levels in New York City have shown differing volumes per lane, depending upon the composition of the traffic. For instance, on Park Avenue, with three free lanes between the sidewalk and the center mall, the rate of flow between 5 and 6 p.m. was 1500 vehicles per lane per hour. This traffic was practically 100% private passenger cars. On Canal Street between the Holland Tunnel and the Manhattan Bridge to Brooklyn, capacity traffic was observed between 4 and 5 p.m. to total 980 vehicles per lane per hour. But here, on this 60 foot roadway having two free lanes in either direction, 35% of the vehicles were trucks. On First Avenue, also a 60 foot street carrying 35% trucks and buses, the capacity volume between 4 and 5 p.m. was found to be 1050 vehicles per lane per hour. On the Queensboro Bridge between plazas, with 5 lanes (center lane reversible) the capacity flow totaled 1000 vehicles per lane per hour, composed of 17% trucks and buses.

Average speed of traffic was highest on Park Avenue, where the highest volume (1500 vehicles per lane per hour) average 20 m.p.h. Other averages were: Canal Street, 10 m.p.h., First Avenue, 15 m.p.h., and Queensboro Bridge, 15 m.p.h.

Thus it is evident that the capacity of a lane on these four streets, depends upon the mixture of traffic.

Traffic Units

In order to properly understand and determine the causes responsible for the discrepancy, we must apply a method of weighting, rating or converting to a common basis, in order to differentiate between real and apparent quantity of traffic. On Park Avenue we had all private vehicles, while on the others we had a mixture, private vehicles, trucks and buses. First we convert all vehicles (apparent traffic) into terms of traffic units (real traffic) by arbitrarily assigning a value of one traffic unit to each private vehicle, two traffic units to each truck, and to buses, a weight of five.

After converting our vehicular traffic into traffic units and replotting their distribution through the day, we have a curve that is not necessarily parallel to our vehicular curve, but its fluctuations are in accordance with real traffic—density, weight, bulk and slowness which in most instances are true causes of congestion.

The value of one traffic unit for private vehicles is used as a base. The value of two traffic units for trucks may be debatable, but in the light of truck weight and size, distribution together with their average slower speeds and rates of acceleration, their bulkiness and in many instances their lack of maneuverability, it is a fair and reasonable value. Partly as justification for this, it has been observed that the maximum truck vehicular flow is less than one-half of the vehicle volume registered in the adjacent private vehicle lane, leading to conclusion that trucks are double the value of automobiles, in terms of lane capacity units.

In accordance with traffic regulations on the East River bridges, trucks are compelled to use the extreme right lane only. Traffic studies of 27 maximum 30 minute periods show that the maximum half hour truck flow was 427 trucks flowing continuously for the whole period; the average was 349 for the whole 27 periods; 380 for Manhattan Bridge, 337 for Williamsburgh Bridge and 343 for Queensboro Bridge. These bridges were selected because they are the only ones to my

Scotchlite REFLECTI

REG. U. S. PAT. OFF

The Road to Safety is Marked with

SCOTCHLITE

Keep your highways marked for safety by fabricating signs with "SCOTCHLITE" which gives the same visibility day or night—highly legible by day, like a lighted sign at night because of its brilliant, non-glare, reflective qualities.

"SCOTCHLITE" can be used for new signs or to re-face old metal signs. It is flexible and easy to apply requiring no experienced help. Available in roll or sheet form and in four colors; white, silver, yellow or red.

MINNESOTA MINING AND MANUFACTURING CO.

3-M PRODUCTS

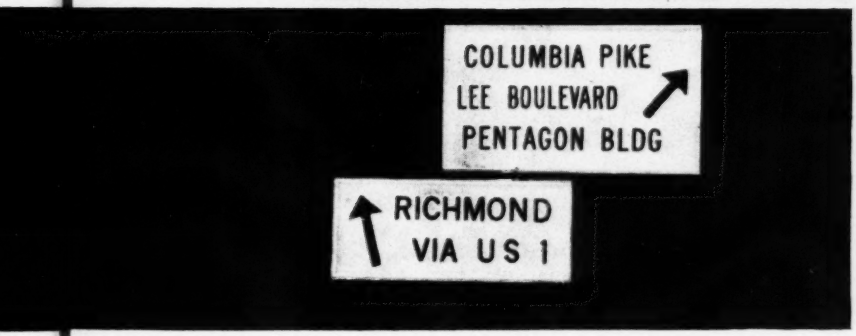
GENERAL OFFICES: SAINT PAUL 6, MINN.

BRANCHES IN PRINCIPAL CITIES

EASIER TO READ

When writing advertiser

CTI N MATERIAL *24 Hour Visibility*



EASIER TO MAINTAIN

Minnesota Mining & Manufacturing Company TE-444
900 Fauquier Avenue, Saint Paul 6, Minnesota

☐ *Kindly send further information on "SCOTCHLITE"*
☐ *Have your sales representative call*

Name _____

Address _____

City _____ *Zone* _____ *State* _____

knowledge where TRUCK traffic is assigned an exclusive truck lane and made to stay in it, and where there is enough truck traffic to sustain continuous truck flow for long periods.

While it is true that many trucks are not large and capable of speeds and acceleration comparable to private vehicles, there are also great numbers of heavy and bulky trucks interspersed in the traffic stream generally.

It is to be conceded that mass transportation vehicles play a most important part in our present day society. Without them we could hardly cope with the present day transport problems, especially in this city (New York) where they provide transportation to more than 700,000,000 trips annually. Their use of the highways is essential to the millions who ride. Their weight and size is necessary to sustain static and dynamic loads and provide adequate facilities and carrying capacities with the minimum number of units for the maximum services.

To serve efficiently it is necessary that their routes lie in heavily populated areas. They must stop to load and unload enroute. They do however, present a most serious traffic problem, especially in our urban areas devoid of adequate traffic facilities. They must stop to load and unload passengers, mostly at the curb, and in doing so time is consumed and speeds are reduced with consequent delay to other vehicles. When pulling back into the "live" lanes other traffic must give way, thus throwing the stream off balance. Their necessary width and length, especially on our older highways, develops a feeling of reluctance in minds of drivers to overtake them thus slowing the traffic stream to the rate of the slower vehicle.

A weight of five is applied to buses to compensate for the effect they attribute to other vehicles especially to maximum flows.

Taken from a paper given before the Society of Municipal Engineers by John Gibala (Mem.), Civil Engineer, Engineering Bureau, New York Police Dept.

So You're Going to Plan a City

IT IS a virtual certainty that after the war an immense amount of public and private construction will be undertaken in and around our cities and towns. To guard against the danger of building in the wrong places—in places where the very existence of new structures will be another obstacle to necessary changes in street or other layout, or where they will create more overcrowding and more traffic congestion—there is urgent need for urban communities to begin planning now.

The choice before them is whether to undertake patching jobs to deal with recurring emergencies, or to launch an all-out attack that will get at the underlying causes of the modern city's troubles. The first method has been tried. It has not arrested the process of decay in the city's interior that destroys property values and creates difficulties in municipal finance. It has not prevented the kind of rank suburban development that promises future blight and overburdened transit systems. Therefore it would seem logical to try some real planning.

The governing purpose, of course, is to plan and build, or to replan and rebuild the cities for the material and spiritual well-being of those who dwell therein. Every city must be economically efficient, comfortable to live in and make a living in, and beautiful. To see how as a practical matter these

STREET CORNER STUDIES

...The *practical* basis for designing

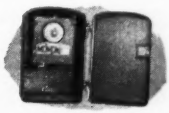
Novalux

TRAFFIC-CONTROL EQUIPMENT

THE outstanding efficiency and flexibility of G-E Novalux traffic-control equipment—its ability not only to meet existing needs, but also to anticipate future problems—stem from actual traffic surveys. The data you supply and the wants you express are continually being correlated and analyzed by design engineers of long experience in this field, having an eye to low cost and dependable equipment. Hence you can be sure of finding a truly economical answer to your equipment problems in the G-E Novalux line of controllers and signals.

You can obtain the latest information on G-E Novalux traffic-control equipment simply by addressing the nearest G-E office. Or write to *General Electric Company, Schenectady 5, N. Y.*

G-E NOVALUX TRAFFIC SIGNALS—adjustable and fixed, meet any traffic need.



G-E NOVALUX TRAFFIC CONTROLLERS—any desired phase or color sequence.

GENERAL ELECTRIC

453-29-3270

Novalux TRAFFIC CONTROL

BUY WAR BONDS

When writing advertisers, please mention TRAFFIC ENGINEERING

things can be attained, we shall first of all have to understand clearly the difference between over-all planning for an urban community in its entirety—for all the area in and around a city or town, irrespective of corporate limits, which is in fact part of the community—and the sort of blueprinting of roads and streets and buildings that is commonly thought of as planning. Especially we shall have to understand that over-all planning, conveniently described as "master planning," has to do first with long-range policies and objectives and second with specific construction programs and schedules.

The Framework of Facts

The take-off is a study of the particular community to find out what there is to start with. There should be surveys and analyses of:

The community as a whole
The people
The economics of the community
Present layout
Land uses
Housing
Transportation
Trends
Special problem areas

These are the rock-bottom essentials for any long-range community planning. In addition, of course, information must be gathered and analyzed about the various social services—education, recreation, sanitation, health, etc.—as well as any particular problems, such as floods, earthquakes, or other hazards that may exist locally. Any or all of these essentials may be further broken down or subdivided as the needs dictate. The emphasis on each, and thus the time and attention required for each, will vary with the different communities, but all should be considered. Taken together they are the point from which the over-all planning starts.

The Planners' Tightrope

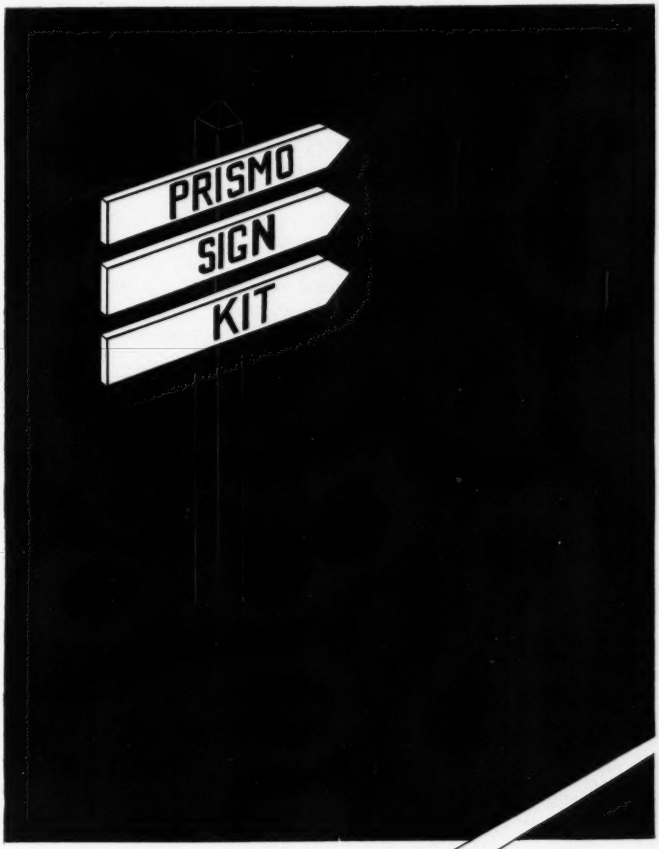
From the beginning, the studies and analyses should be accompanied by tentative master planning. The general method is that of making preliminary sketches, checking these against newly assembled facts, and revising again. Thus the main outlines of an over-all plan take shape.

Adaptation of ultimate goals to practical possibilities is, of course, the crux of the master-planning problem. If the hands of the planners are tied by too much consideration of vested interests, existing property rights, and present legislation, the plan will be hardly worth making. If on the other hand too much violence is done to current ideas of what ought to be required of property owners and others in the public interest, the plan will be likely to gather dust. Its chances of success will be determined both by the skill and courage of the planners and by the degree to which the people of the community understand the problems to be dealt with and approve the solutions proposed.

The master plan as a whole is much more than a map of streets and buildings. It must be thought of, particularly where the community is large, as something like the direction of a prolonged business operation. But even so, it is no more difficult and complex than the problems commonly solved by any large business concern. The telephone company, a big railroad and electric-power system—such organizations as these are obliged to meet and solve problems comparable in many ways to those of planning or replanning a city.

How long does it take to produce a master plan? The time will depend partly on the size of the city or town, partly on how the job is organized. It will depend also upon how much planning has already been done. Actually most of the larger cities and many of the smaller communities have done a

PRISMO SIGN KIT



THE RIGHT DIRECTION .... FOR SAFETY

THE PRISMO SAFETY CORPORATION

HUNTINGDON · · · · · · · PENNSYLVANIA

good deal, although rarely on a scale comprehensive enough for the sort of planning now required.

Probably an ideally staffed planning organization could start from scratch and come through with a fairly well worked out proposal for a master plan within six months. But to get a plan with a good chance of being carried out, the procedure is of necessity longer. Not to be overlooked in the time required, moreover, is the matter of personalities—stubbornness, preconceived ideas, and maybe pure cussedness, on the part of the individuals and groups that must come to agreement.

Overlapping Problems

Fundamental to master planning are the twin problems of land use—which land and how much shall be used for what—and transportation. Where the people live and work and play, how much space they need for their manifold activities, how they are to get from place to place, how the things they make and use are to be most conveniently moved: these are the elemental considerations in city-planning strategy. And in the light of what is happening to the cities and towns today, in view of the fact that by and large (apart from war-boom conditions) they now grow by spreading out over the countryside rather than by increasing their population, there are obviously two sides to the task of planning and guiding their future.

On the one hand is the transformation of the heart of the city to adapt it to modern conditions, to improve its layout and organization so as to relieve present congestion and to achieve stability and order. This is essentially a matter of replanning, since there have always been some city-planning measures, though these have usually been little more than palliatives. What is needed is a long-term approach.

On the other hand is the development of the suburbs. In rapidly expanding communities it is the more immediate urgent problem. Here, too, under ordinary conditions, the working out of a solution will be gradual. But the planning calls for prompt action, at least in a negative sense, lest the new additions get out of hand and defeat the essential purpose of the overall scheme.

Replanning the Interior

The interiors of our cities are beset with problems at once more numerous and enormously more complex than those of the suburbs. The goals are:

(1) Good dwelling accommodations for all who wish to live in the city proper, with apartments, detached, double, row, or group houses to meet the various kinds of family requirements.

(2) Location of residential neighborhoods in relation to business and industry so as to provide easy access to places of employment.

(3) A coordinated transportation system, including all forms of public facilities and the terminals for them, to make travel and transport as pleasant and efficient as possible.

(4) The arrangement of roads and streets and parking space in such a way that all private automobiles (or helicopters or hitherto undiscovered gadgets) can be used with pleasure and safety.

(5) Ample cultural and recreational facilities within easy reach of all who want to use them.

(6) Property values that will remain reasonably stable—to provide valid incentives for home ownership and other investment in real estate, and to permit the municipal government to organize its fiscal affairs on a sound basis.

In short, a rearrangement of the interior is wanted that will put the city

itself definitely and permanently in a position of competitive equality with the suburbs and the countryside.

The inescapable fact is that most of our cities are where they are for compelling reasons of physical topography and economic geography and are going to remain there. Their strategic location with respect to waterways and land transportation is usually such that they could hardly exist anywhere else. Moreover, there is no reason to despair of replanning and rebuilding them to make possible a large measure of combined town and country living.

Communities of Garden Cities?

There is, as might be expected, considerable difference of opinion among planners as to the precise form that the replanned interior of a city should take. Something like general agreement seems to have been reached, however, on the proposition that the interior as well as the suburbs should be reshaped to form neighborhoods. These, for the most part, would be residential; but contiguous to them, perhaps to some extent intermingled with them, would be the various kinds of business and industry providing employment for the working population. Neighborhoods would be separated from each other and from such heavy industry as needs to be segregated by main transport lines, speedways, railroads, or other heavy-traffic arteries. Ultimately the separating zones should be planted with trees and shrubs and utilized as much as possible for parks and gardens. Each neighborhood would be largely self-contained as to schools, churches, local shopping centers, and other public facilities, to minimize the need for the people to cross heavy-traffic streets or roads.

To the extent that it is realized, the entire community will be made up of a number of distinct but closely integrated neighborhoods, separated by green belts and varying in character and density of development. From the center outward, intensity of land use will be lower and lower until the urban complex is merged into and mixed up with the open country.

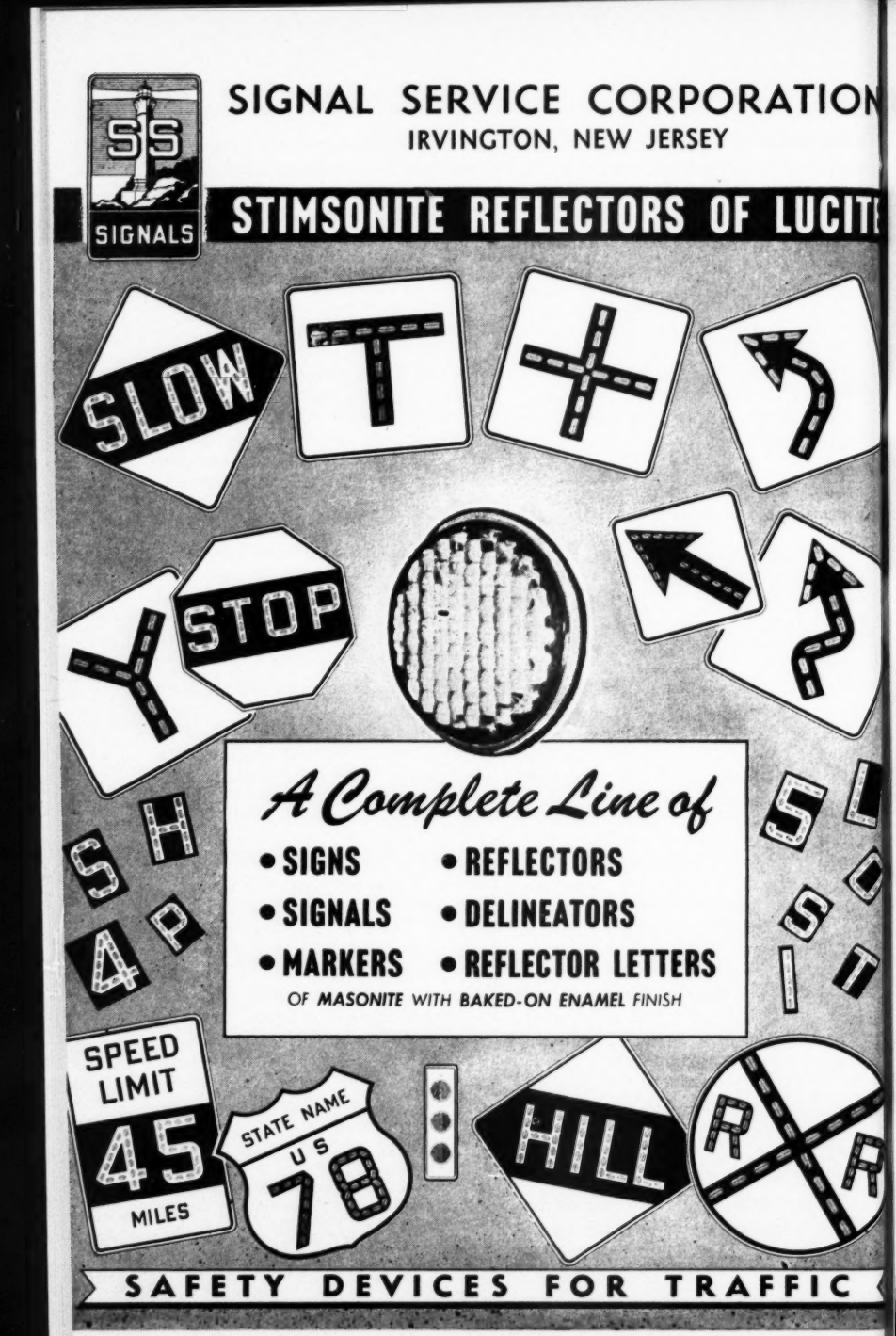
Redistribution of Land Use

To reduce the number of people living or working in areas where there are now too many: that is the major problem of interior replanning. In certain very large cities it can be accomplished only by further draining off the working and dwelling population into suburban areas.

Redistribution of the use of interior land can probably result in an actual increase in the value of all the land within the city limits. But it will require many shifts in values, some of them on a wholesale scale.

There seem to be three possible ways to bring it about. It might be accomplished by arrangements for pooling property ownership and working out subsequently a fair distribution of collective gains. A second possibility would be for one or more great private development companies to buy up enough land, in the interior and in the suburbs, to permit reshaping the overall pattern in accordance with a master plan. But a third method may have to be considered, one that would require large-scale purchase of land by the community itself coupled with far-reaching changes in taxation practices. These possible ways of implementing a master plan, together with the legal and fiscal and administrative problems involved, will be explored in a later issue.

Excerpts from the article "So You're Going to Plan a City," published in *Fortune* Magazine January, 1944. For reprints of this and other articles on City Planning, write the Publisher, *Fortune* Magazine, Time & Life Building, Rockefeller Center, New York 20, N. Y.


SIGNAL SERVICE CORPORATION
IRVINGTON, NEW JERSEY
SIGNALS
STIMSONITE REFLECTORS OF LUCITE
SLOW
STOP
A Complete Line of
• SIGNS • REFLECTORS
• SIGNALS • DELINEATORS
• MARKERS • REFLECTOR LETTERS
OF MASONITE WITH BAKED-ON ENAMEL FINISH
SPEED LIMIT
45
MILES
STATE NAME
U S
78
HILL
SAFETY DEVICES FOR TRAFFIC

ITE NEWS AND PERSONALS

BOARD MEETING IN NEW YORK

Thursday morning, March 30th, Graham Cole, Robert Mitchell, D. Grant Mickle, and William McConochie, members of the Board of Direction, met in the Hotel Pennsylvania with Harold Hammond, President, and Wilbur Smith, Secretary of the Institute. Henry Evans, Co-editor of TRAFFIC ENGINEERING magazine, presented a written report of the past year's activities and plans for the future with regard to the magazine. One of the facts disclosed was that the subscription campaign undertaken under the leadership of George Fisher, Circulation Manager, brought about a net increase in paid subscriptions of 16½% during the first three months of 1944.

New Members

Virden Rittgers, Chairman of the Membership Committee, was present at the Board Meeting to present the committee report. The following memberships were recommended and voted on favorably by the Board.

New Members Admitted:

G. Donald Kennedy, Vice-President, Automotive Safety Foundation.
Lloyd Maeder, Assistant Secretary, New York State Traffic Commission.

New Associate Members Admitted:

John W. Zimmerman, Assistant Service Supervisor, Chicago Park District.
George T. Papageorge, Assistant Director, Georgia State Division of Highway Planning.
B. Atwood Skinner, Traffic Engineer, Charlotte, North Carolina.
Lewis A. Weymouth, Assistant Engineer, California Department of Highways.

Transfer, from Junior to Member:

J. Edward Johnston, Nebraska State Highway Department.

Transfer, from Junior to Associate:

George W. Howie, Assistant Traffic Engineer, Portland, Oregon.

Annual Meeting

The Board directed the Annual Meeting Committee to proceed with plans for the annual meeting to be held October 1, 2, and 3, in conjunction with the National Safety Congress in Chicago. Co-Chairmen of this Committee are E. H. Holmes and Matthew Sielski, aided by William McConochie, General Adviser.

Central States Safety Congress

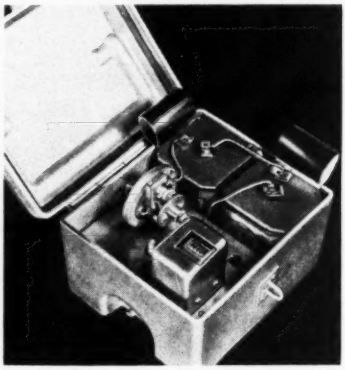
The Board voted to co-sponsor the Traffic Engineering Sessions at the Central States Safety Conference in Kansas City, Missouri, June 6, 7, and 8th. Thomas Seburn (Mem.), Kansas City Traffic Engineer, will be the Institute representative.

Postwar Report Endorsed

The Board voted to add the Institute of Traffic Engineers as one of the National endorsing agencies in connection with the Postwar Traffic Safety Planning Committee Report

A Precision Built

TRAFFIC COUNTER



Accurate and reliable traffic counting requires more than a "gadget". It requires a rugged, durable, precision instrument such as the Streeter-Amet Traficounter.

•

The Streeter - Amet Traficounter was designed by a 5 year old organization specializing in the manufacture of recorders, automatic weighers and related precision instruments. All parts are built of first quality material. Workmanship is performed by skilled craftsmen. The unit is rigidly inspected.

•

The result is a thoroughly dependable long - lasting instrument which accurately counts 900 or more cars per minute, shows 15 minute cumulative totals and offers many other advantages. It's the oldest machine in this field.

Write for literature.

•

Streeter-Amet Company
4105 Ravenswood Avenue
Chicago 13, Illinois

STREETER - AMET

Traficounter

When writing advertisers, please mention TRAFFIC ENGINEERING

recently prepared by the Committee of national representation appointed by the National Safety Council's Street and Highway Section.

New York I.T.E. Section

Thirty-four men attended the March 29th meeting of the New York Section, at the Hotel Holley. The meeting chairman was John Gibala, Traffic Engineer, New York Police Department. In addition to nine non-member guests, there were the following out-of-town members of the Institute present:

James G. Hayden	Grant Mickle
E. H. Holmes	Henry Osborne
William R. McConochie	Fred Fisch
Dwight M. McCracken	R. W. Wilcox
T. T. Wiley	Charles Prisk
J. J. Dobelek	Lloyd Reid

Most of these men were in New York attending the Greater New York Safety Council Convention.

The evening was highlighted by a talk given by Earl Andrews, New York Consulting Engineer, on the "Future Plans for Parkway Construction in the New York Area".

Virden Rittgers was unanimously chosen for Chairman of the April meeting, which is tentatively set for April 27th, at the Holley Hotel. Any out-of-town members who may be in New York at that time are urged to attend.

Washington, D. C., I.T.E. Section

Twenty Institute members and guests attended the dinner meeting of the District of Columbia Section on March 15th. Mr. F. W. Lovejoy, Executive Secretary of the District of Columbia, Highway Traffic Advisory Committee to the War Department, spoke informally on the parking problem. He described in some detail the recent New York Traffic and Parking Survey in which he participated, and emphasized the need for a scientific technique for determining parking requirements if we expect important private capital to seek investment in parking facilities.

The next meeting of the group is planned for May 17th according to William Eliot, 3rd (Assoc.), Secretary-Treasurer of the District of Columbia Section.

Institute Represented on Pedestrian Protection Committee

The Institute of Traffic Engineers will be represented by Harold F. Hammond, President, as one of a committee of six judges to determine the winners of the 1943 Pedestrian Protection contest sponsored by the American Automobile Association. Evidence of the growing official interest in Pedestrian Protection is the fact that all 48 states and 1,059 cities, 49% more than in 1942, participated in the contest this year. Each year awards are made to cities and states charged as having the best combination of Pedestrian Accident Records and Pedestrian Programs.

Joint Committee On Speed

This Committee, upon which Wilbur Smith (Mem.), Secretary of the Institute, is representing the Institute of Traffic Engineers, has announced appointment of Joseph Kluchesky, Milwaukee Chief of Police, and Vice-President of the International Association of Chiefs of Police, as Chairman of the Joint Committee. Harry Neal (Mem.), Ohio State Traffic Engineer, representing the American Association of State Highway Officials, is Vice-Chairman, and Donald Berry (Assoc.), of the National Safety Council, is Secretary of the Joint Commit-

Armor-Flex Traffic Markers

An Armor-Flex installation two years old - no maintenance

This remarkable plastic marker is being rapidly adopted by traffic officials because they have tried it in their "tough" spots and it has sold itself. Markings placed ten years ago are still in service. It's the most for your "marking dollar" and takes the "headache" out of traffic marking.

Armor-Flex is easily and quickly installed with simple equipment which we supply. Applied to the pavement surface with special hot mastic. Traffic uses at once. It is self polishing and maintains very high visibility. Any desired size of markings can be supplied. Wide variety of pavement messages. Our agents supervise first installations.

Get our comparative marking costs—"Painting vs. Armor-Flex". Authentic data from the experience of leading traffic officials.

BE SURE TO CONSIDER ARMOR-FLEX FOR POST-WAR PROGRAMS

Representatives throughout the U. S., Canada and Great Britain
(Except in S. E. States, Maryland to Florida, where agents are wanted)

For Full Information Write

ARMOR-FLEX COMPANY
6993 Hillsland Ave. **St. Louis 9, Mo.**

When writing advertisers, please mention TRAFFIC ENGINEERING

tee. Other Institute members on this Committee include Earl Allgaier (Jun.) of the American Automobile Association, Harold F. Hammond (Mem.), National Conservation Bureau, Leslie Sorenson (Mem.), Chicago City Traffic Engineer, and Charles W. Prisk (Jun.), Public Roads Administration.

PERSONALS

Lt. WORTHAM DIBBLE (Assoc.), writes from somewhere in the South Pacific saying that he has now put in all foreign duty and combat time necessary for a leave of absence, and hopes to be getting back to the States soon. Dibble is on leave from the South Carolina Highway Department.

Lt. Col. PAUL RISTROPH (Assoc.), is key man in guiding the traffic and transportation activities at the Pentagon Building in Washington, D. C. Activities which he guides include: Transportation of War Department personnel and material to and from the building, via commercial carriers and passenger cars, plus traffic control and parking.

T. ELMER TRANSEAU (Mem.), Director, Pennsylvania Bureau of Highway Safety, has recently been announced as Chairman of the Committee on Forms and Statistical Practices of the National Conference on Uniform Traffic Accident Statistics. The American Association of Motor Vehicle Administrators, in making this announcement, also stated that DAVID BALDWIN (Assoc.), of the National Safety Council, has been appointed Secretary of the Conference.

OTTO JELINEK (Mem.), who has been temporarily associated with the Office of Civilian Defense as Chief of Techniques, announces that he is now back with the Chicago Park District.

HAROLD F. HAMMOND (Mem.), President of the Institute, has begun a transportation survey of Cincinnati, Ohio. Change from three shifts back to two shifts in industry has complicated the transportation situation in that city.

NEWS FROM HERE AND THERE

CONSULTING ENGINEERS: Two resolutions adopted at the recent board meeting of the American Institute of Consulting Engineers, and forwarded to Congress, call attention to federal government engineering trends that are considered to be unsound and not in the public interest. One relates to the Kilgore and Patman Bills, S. 702 and H. R. 2100, that would set up an Office of Scientific and Technical Mobilization, while the other is concerned with the current use of federal employees as consultants to foreign governments.

EDITOR'S NOTE: *The I.T.E. Policy Committee, Burton Marsh, Chairman, is now making plans for the Institute to officially oppose Bill* 702.

An Office of Scientific and Technical Mobilization, with large powers in the fields of science, research and engineering, bears resemblance to agencies "used by governments in Fascism and National Socialism," according to the Consulting Engineers. They point out that the effect of such an office would be to disrupt the present highly successful methods of scientific and technical research, and to deaden private and individual initiative. For these reasons, the Institute of Consulting Engineers is opposed to the passage of the proposed bill.

With respect to the employment of federal engineers in foreign countries, the resolution points out that the Public Roads Administration is surveying and preparing to supervise the construction of roads in Bolivia; that the

PLAN TODAY

To Use GROTELITE

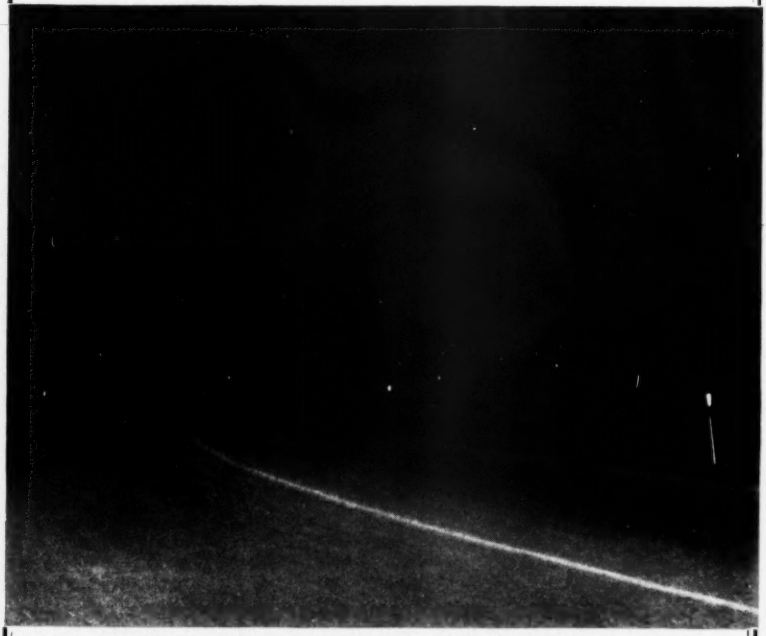
PLASTIC REFLECTORS ON TOMORROW'S HIGHWAYS

These sturdy roadside delineators are equipped with the new Grotelite plastic reflector.

They are prismatic type; front face is smooth.

High intensity reflection at long range. Extreme angularity without loss of reflecting power. They remain visible almost up to the point of passing by the vehicle. Housings are of rugged construction, durably finished.

BE SURE TO SPECIFY GROTELITE PLASTIC REFLECTORS FOR ECONOMY



The Grotelite Co., Inc.

Bellevue, Kentucky

Tennessee Valley Authority is assisting in the design and construction of hydroelectric plants in Russia; and that other bureaus and agencies of the federal government are increasingly carrying on more outside engineering work, both at home and abroad. Since such services of our federal bureaus to foreign countries, the resolution states, are normally not essential, due to the ample facilities available from engineers in private practice, the I.C.E. regards it as inadvisable, improper and not in the public interest for the federal government to tax the public to pay its employees for doing work in foreign territory outside of their regular duties, which work consulting engineers are qualified and prepared to do.

O.D.T.: J. Monroe Johnson, a member of the Interstate Commerce Commission, recently was named by President Roosevelt to be Director of the Office of Defense Transportation succeeding the late Joseph B. Eastman. Brigadier General Charles D. Young, Deputy ODT Director, served as temporary head of the organization for several weeks prior to Johnson's appointment.

Johnson became a member of the ICC in June, 1940, after serving five years as Assistant Secretary of Commerce. He is a native South Carolinian with the rank of colonel in the first World War and has held several state offices.

PAN-AMERICAN: Major General Philip B. Fleming, Federal Works Administrator, Commissioner Thomas H. MacDonald (Hon. Mem., I.T.E.) of the Public Roads Administration of the Federal Works Agency, and E. W. James, chief of the PRA Inter-American Regional Office, are now on an inspection tour of the Inter-American Highway.

BUS PRODUCTION, 1944: WPB has set a tentative quota of 6,960 integral type buses to be built for civilian use this year; indications are that 1,700 will be alloted to intercity service. . . . A. M. Hill, president of the National Association of Motor Bus Operators, tells us that more than 4,000 of the Nation's 22,000 intercity buses are over eight years old, which is the life-expectancy of such vehicles. . . . And that although highway buses are now carrying triple the number of passengers of any prewar year, no new equipment has been made available for over-the-road use since 1942 — and there is an acute need for replacements.

LOOKING AHEAD

American Society of Planning Officials, Annual Meeting, Stevens Hotel, Chicago, Illinois, May 1-3.

American Association of Motor Vehicle Administrators, Annual Meeting, Chicago, Illinois, June 20-23.

Society of Automotive Engineers, National Transportation and Maintenance Meeting, Bellevue-Stratford Hotel, Philadelphia, Pennsylvania. June 28-29.

Central States Safety Congress, Kansas City, Mo., June 6, 7, and 8.

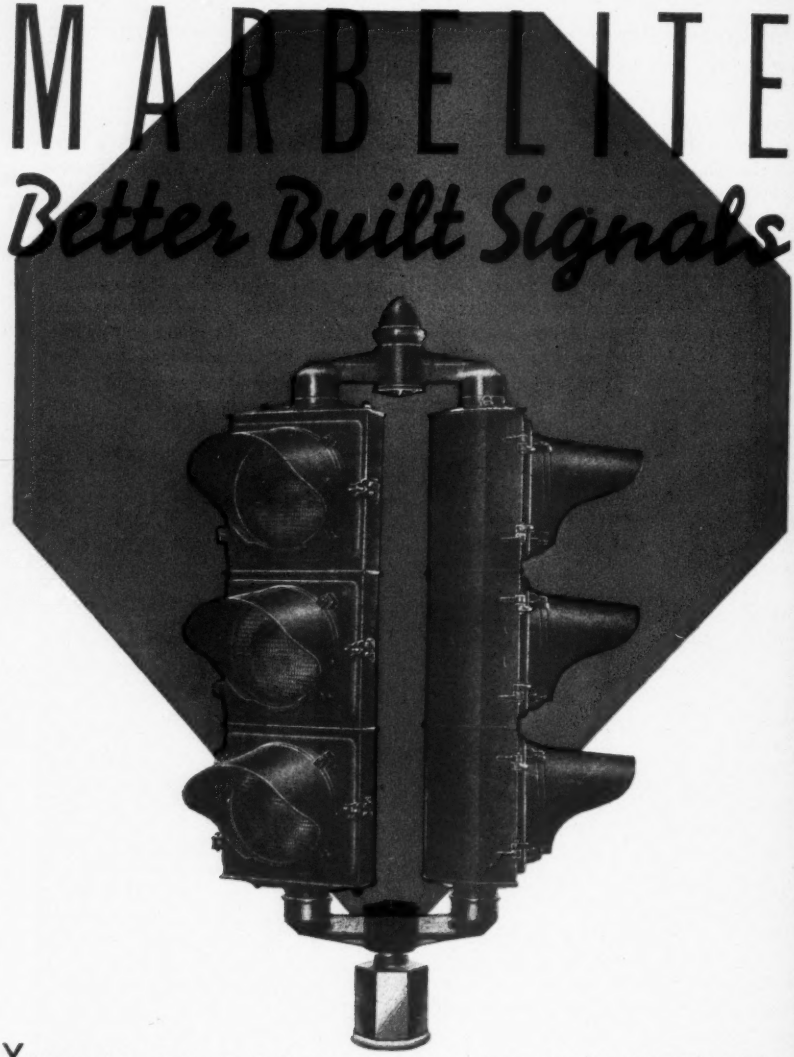
New York I.T.E. Section Meeting, Hotel Holley, April 27.

Washington, D. C., I.T.E. Section Meeting, May 17.

Institute of Traffic Engineers Annual Meeting, Chicago, October 1, 2 and 3.

MARBELITE

Better Built Signals



YOU can determine by just looking at this advanced design of a Two Way, Three-Color adjustable Signal that it is BETTER-BUILT.

Note the reinforced aluminum mounting brackets that replace the conventional pipe and fitting assembly. A compact, sturdy arrangement, eliminating small, minor parts.

You bet! It is BETTER-BUILT quality.

That isn't all, but it gives an idea of why Marbelite Signals are approved by numerous State and City Traffic Departments as well as Traffic Associations, and why there are so many thousands of Marbelite Signals in use in these Cities and States.

Familiarize yourself with other Marbelite features, such as the unbeatable optical unit. You will be proud to have such fine quality Signals regulating traffic in your community.

THE MARBELITE COMPANY, INC.

26 WARREN STREET **NEW YORK 7, N. Y.**